Untapped Talent:
Can better testing and data accelerate creativity in learning and societies?

Tuesday, December 15, 2015

The Power of Data

That we now have at our finger tips more data about students than we ever had before is indisputable, but how can we actually realize the power of this data to benefit the education system as a whole and the individual student?

Although repeated testing is controversial, cognitive data shows that testing can also be used for learning; students who study and answer test questions are more likely to retain information than those who only study. Testing in and of itself is a learning process, and particularly when provided with feedback to students, can be a powerful opportunity to support learning. However, we cannot forget that testing measures *performance* rather than learning, and performance may not always reflect learning. For example, the pressure of performing can lead to increased anxiety, which in turn reduces exam performance.

Learning is better retained when links can be made between different subjects and strategies – this also encourages greater creativity. If tests can be designed to make connections across curricula, the anxiety associated with tests could be countered, improving performance and increasing learning outcomes.

We need to not only measure and assess for learning, we need to also measure and assess well. Using online testing which tracks students' progress *during* the test, as well providing a score at the end, can help educators understand their students' cognitive processes and reasoning – not just see what the student got right or wrong. This moves beyond simply using "computers to do all the work" for the teacher, and instead combines technology with pedagogy, encouraging teachers to enter into a conversation with their students after the test is done.

Regardless of the data used, it is not about its size, but rather *how* the data are used. Different data are useful to different stakeholders; what is useful to a teacher to help their students learn better, is not the same information as is needed by policymakers or that which can be easily understood by the public.

Terry Mazany tells American students to "Get Lost" – in their learning

"Accept disruptive technologies!"
How might Big Data and "Uberization" impact education?

Uber did it to the taxi industry. AirBnB is doing it to the hotel business. What sort of "disruptive" technology could have a similar impact on education?

The use of big data and linking it to formal assessments is already causing shake ups in countries such as Ecuador, where its initial rankings of schools based on assessment results alone did little besides upset students, parents, teachers and policymakers alike. Linking that data to multiple other data sets, however, has proven hugely insightful.

By applying bigger data sets, such as socioeconomic, demographic, type of school, etc., the National Institute of Educational Evaluation was able to start building a much fuller picture of why some students thrived while others struggled, despite attending the same sort of school, or coming from the same socioeconomic background. Considering variables as detailed as gender balance, pupil and parent satisfaction levels, school life, pupils' distance to from school, attendance, etc., gave an even fuller picture as to why some schools were performing better than others – and offered insights into how to improve those that were struggling.

In some countries, such as the UK, school inspections are carried out to try to make similar assessments, but in countries of more limited resources and more remote communities, this data is even more valuable: "We can't visit all the schools! That's what we need data for," remarked one Fellow.

Another tech solution that is promising to be "disruptive" is LRNG in the US. Recognizing that learning can, does, should continue outside of the classroom, LRNG aims to "transform learning from something [students] do to something they live." Through predesigned and interchangeable "playlists", students can "get lost" in a topic of their choice and interest, by accessing online and in-community resources, receiving in-person mentorship, attending "real life" events, and ultimately achieving a "digital badge" – a qualification that Collective Shift (the organization behind LRNG) hope will eventually be recognized by universities and employers.

Education needs this "disruptive innovation" because "the world isn't going to wait for our schools to improve in 10 year blocks," and students need 21st century skills now to guarantee their success in the future.

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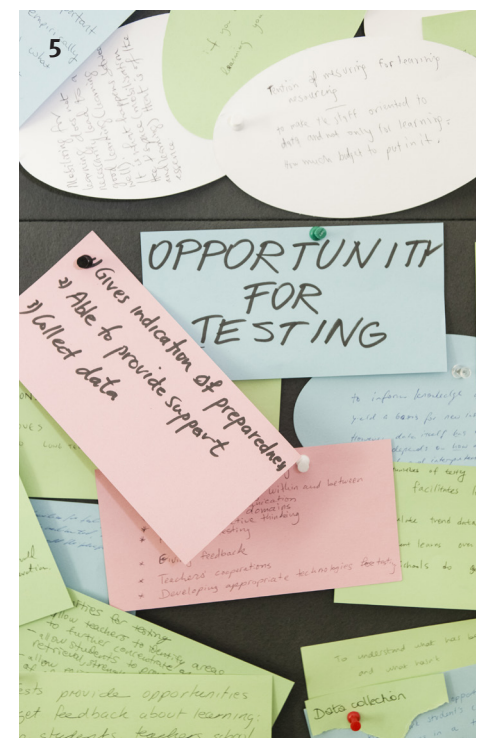
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1. Andres Peri and
Lindsey Richland

2. Panelists Harvey
Sanchez Restrepo,
Maddalena Colombo and
Terry Mazany

3. Schloss Leopoldskron

4. Paul Jansen and the
Latin American delegation

5. Fellows share
their thoughts on the
opportunities for testing

Join in online & untap your writing talent!

If you're interested in writing either an op-ed style article for our website or the session report, or a personal reflection blog post while you're here this week, please let Salzburg Global Editor, Louise Hallman know or email your submission directly to lhallman@salzburgglobal.org.

If you do intend to write for your own organization either whilst you're here or after the session, please make sure to observe the **Chatham House Rule** (information on which is in your Welcome Pack). If you're in any doubt, do not hesitate to contact Louise.

We'll be updating our website with summaries from the panels and interviews with our Fellows, all of which you can find on the session page: www.SalzburgGlobal.org/go/558

You can also join in the conversation on Twitter with the hashtag #SGSedu and see all your fellow Fellows on Twitter via the list www.twitter.com/SalzburgGlobal/lists/SGS-558

We're updating both our Facebook page www.facebook.com/SalzburgGlobal and our Flickr stream www.flickr.com/SalzburgGlobal with photos from the session during this week and also after the session. (If you require non-watermarked images for your own publication, please let Louise know.) We will also be posting photos to Instagram www.instagram.com/SalzburgGlobal, and we encourage you to do so also, using the hashtag #SGSedu.

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Vari Mureriwa, managing director of the P-STEM Foundation, South Africa

Varaidzo Mureriwa: STEM, in its very essence, is creativity

Managing director of the P-STEM Foundation, discusses the potential for STEM solutions to tackle South Africa's youth unemployment

Heather Jaber

What are 21st century skills? Do they vary in form and context? How can we define one of the most pressing issues for young people today? For Varaidzo Mureriwa, managing director of the P-STEM Foundation, it's about sustainability.

Mureriwa, participant of *Untapped Talent: Can Better Testing and Data Accelerate Creativity in Learning and Societies?,* worked as a technology consultant before becoming a STEM (Science, Technology, Engineering and Math) education advocate. The P-STEM Foundation is South Africa's only non-governmental STEM advocacy organization.

"What quickly became evident to me and some my colleagues is that while South Africa has a big youth population, it's unable to translate that youth into viable, sustainable careers," she says.

The case for youth unemployment in the region is particularly devastating—unofficial numbers put youth unemployment at about 40%. Of that percentage, says Mureriwa, 70% are between the ages of 14 and 35. Having 21st century skills is particularly relevant in the South African context, she explains.

Mureriwa quotes former US Secretary of Education Richard Riley when discussing 21st century skills and the context of the youth in South Africa in particular: "We are currently preparing students for jobs that don't yet exist."

"[It means] having skills or teaching our students skills today that will enable them to have sustainable careers for the duration of their careers," said the participant. "And why that's necessary today versus 50 years ago is the rate and pace at which life is changing."

To keep up with this rapidly changing world, creativity is vital to a sustainable career, believes Mureriwa. While creativity is not often conflated with the sciences and math, it is a major component of STEM, says Mureriwa.

"If you look at STEM in itself, in its very essence is creativity," she says. "Someone had to be creative to come up with that new technology. Someone had to understand a mathematical concept and be able to translate that into modern world reality."

To do that today, we need foundational knowledge, said Mureriwa. In South Africa and Sub-Saharan Africa in particular, it is important to target attitudes towards math and sciences. A lack of access to STEM resources or education centers also contributes to these attitudes.

"The dialogue needs to shift in order to be more encompassing," she says, "but at the same time the innovations need to be able to meet people where they are."

"What's really great about being involved in this 21st century is a lot of the traditional barriers have been removed," she enthuses, highlighting the opportunities that now exist for closing these gaps and shifting attitudes. Connecting students with STEM role models and running STEM community days in rural communities are some of the methods P-STEM have effectively used, shifting from the idea that schools and governments are the center of education to more acknowledging the community's role.

For the STEM education advocate, the session in Salzburg is also challenging conventional thinking about creativity.

"What I'm really loving is thinking about creativity from an assessment perspective and breaking down some of the assumptions I've had. I've always assumed trying to assess for creativity curbs creativity…then I started questioning my assumptions."

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Some not-so-traditional poses for the traditional group photo in front of the frozen Leopoldskroner Weiher and Untersberg

Hot Topic:
"What are the opportunities – and problems – with testing?"

Ana Alania & Heather Jaber

"There are many advantages to testing because you know where you are and where you're going with that particular subgroup of children, but I think there are also a lot of problems interpreting just what the data mean… and that it's important to be able to understand exactly what sort of questions you're asking and whether you're tapping what you think you're tapping."

April A. Benasich
Professor of Developmental Cognitive Neuroscience, Rutgers University, USA

"The first [opportunity with online testing] is the possibility of setting a test for the whole country and being able to reach every school and every kid. So we estimated the amount of paper that would imply that and that would be tons of paper – many trees are saved because we're doing this… The second thing is to have results in real time so we can inform teachers on the next lesson they have to do given what happened in the test. Those things in the past implied four months of work, now we're doing real time results. [But] think about doing something for a whole country using computers and the internet: there's always at least a glitch in part of the process. The key issue is that the effort of doing the testing is less than what you get from it… for example the connection can slow down, they can collapse… Some of the problems are that you need an infrastructure in order to do things on the technological side that have to be in place so that the technology pays off in what you want to do."

Andrés Peri
Director, Research and Evaluation Department, National Administration of Public Education (ANEP), Uruguay

"Nobody yet discussed the early childhood testing and it's a very difficult matter how to test a young child – a one, two, three year-old child, because we would like to test our work. This is a very hard global question: how do we test young children? We would like to know where they are, we would like to know if the prevention program I'm giving them is useful for them, but we can't ask them. So we will need to have an adult to ask him how his child is moving on. But I think we need to develop a tool that a child can give us feedback as well. So this is quite a problem that we do not have any tools, that I know, that can bring from the children some information about where they are."

Ayelet Giladi
General and Academic Manager of Early Childhood Programs, NCIW Research Institute for Innovation in Education, Hebrew University of Jerusalem, Israel